CHBE 470 Process Dynamics and Control

Fall 2018

Tuesday & Thursday, 8:00-9:15, 1070 Duncan Hall

Faculty

Dr. Marya Cokar, Room AEL-B226, marya.cokar@rice.edu

Teaching Assistants

Mr. Rohan Adhikari, ra47@rice.edu, AEL B239

Mr. John Lazar, jtl9@rice.edu, AEL B233

Ms. Njideka Nnorom, ncn2@rice.edu, AEL B239

Office Hours

Dr. Marya Cokar Thursdays 10-12pm AEL-B226

TA Office Hours

Mr. Rohan Adhikari, Monday 10:30 am – 12:30 pm AEL B239

Mr. John Lazar, Tuesday 4pm – 6pm AEL B233

Ms. Njideka Nnorom, Wednesday 2pm – 4pm AEL B239

Course Description

Process dynamics and control is an important aspect of any chemical process, be it a traditional petrochemical plant, a biochemical drug manufacturing unit or a nanoparticle manufacturing facility. The need to remain at a desired operating condition for economical and safety reasons in the face of ubiquitous disturbances has led to the development of this subject. It is the goal of this course to introduce to students the dynamical nature of chemical process,

importance of modeling processes, various aspects of a control system and the design a control system.

Course Prerequisites

ChBE 390, ChBE 402, and ChBE 412

Required Textbooks

“Process Dynamics and Control”, 3rd Edition, by Dale E. Seborg, Thomas F. Edgar, Duncan A. Mellichamp, ISBN 978-0-470-12867-1

OR

“Process Dynamics and Control”, 4th Edition, by Dale E. Seborg, Thomas F. Edgar, Duncan A. Mellichamp, Doyle, Francis J. III, ISBN 978-1-119-28591-5

Canvas

Please check the CHBE 390 Canvas Site regularly for announcements, lecture notes, resources, and homework assignments. You are responsible for reading all the Canvas announcements in a timely fashion. Sign in with your NetID and password to http://www.rice.edu/canvas/

Homework Policy

Homework will be due by 4:00 pm to the dropbox (next to Abercrombie B228) two weeks from the date of assignment unless otherwise stated. Any assignment submitted later than the posted deadline will receive a penalty of 10% for each full day after the posted deadline. Homework will not be accepted after two full days beyond the posted deadline.

Honor Code Policy

The exams will require the honor pledge. All exams will be in-class.

Students are encouraged to discuss the homework sets with other students, the teaching assistants, the instructor, or anyone else. The assistance is limited to the discussion of the problem. Consulting another student’s solution (even from a previous ChBE470 class) is prohibited and homework solutions may not be copied from any source.

Lecture Topics

- Dynamics of chemical processes
- Laplace transforms
- Transfer functions
- Analysis of process models
- Development of empirical models
- Feedback control
- Stability analysis of closed-loop systems
- Multivariable control
- Tuning of feedback controllers
- Introduction to advanced control strategies

Special Needs

If you have a documented disability that may affect academic performance, you should: 1) make sure this documentation is on file with Disability Support Services (Allen Center, Room 111 / adarice@rice.edu / x5841) to determine the accommodations you need; and 2) meet with me to discuss your accommodation needs during the first two weeks of class. All discussions will remain confidential.

Grading

The class will consist of 1 midterm exam, 1 final exam and 6 assignments one new assignment will involve laboratory experimentation. Grade distributions will be as follows:

Homework – 30%

Midterm Exam – 30% (October 11, In-class)

Final Exam – 40%

Any student with a documented disability seeking academic adjustments or accommodations is requested to speak with Dr. Wong during the first two weeks of class. All discussions will remain as confidential as possible. Students with disabilities will need to also contact Disability Support Services (x5841) in the Allen Center.

Course Summary:

Date	Details
	Homework 1

Course Status

Unpublish Published

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Course Analytics

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Calendar

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
26Previous month	27Previous month	28Previous month	29Previous month	30Previous month	31Previous month	1
2	3	4Today	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	1Next month	2Next month	3Next month	4Next month	5Next month	6Next month

Course assignments are not weighted.